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JoAnn Villamizar			HORNING, JOEL G	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/566,743

**Applicant(s)**

MACOR ET AL.

**Examiner**

JOEL G. HORNING

**Art Unit**

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 June 2009.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18, 20 and 22 is/are pending in the application.  
4a) Of the above claim(s) 20 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-18 and 22 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Claim 20 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 06-05-2009.

***Information Disclosure Statement***

2. The information disclosure statement filed May 1<sup>st</sup> 2006 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each document listed that is not in the English language (H. Jacobasch et al reference). It has been placed in the application file, but the information referred to therein has not been considered.

***Claim Rejections - 35 USC § 112***

**The following is a quotation of the second paragraph of 35 U.S.C. 112:**

**The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.**

3. **Claims 1, 3-7 and 9-17** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 1 has been amended to include the language "and optionally dried to remove solvent if present, and irradiated with electromagnetic waves..." This language leads to uncertainty in how it should be interpreted. Is the irradiation step an optional

step? If it is optional is irradiation done additionally or alternatively to the drying step? For the purposes of examination, since this is what applicant is arguing, it will be assumed that applicant intended the irradiation step to be a required step. The drying step is still optional.

5. Claims 3-7 and 9-17 are rejected for depending upon a rejected claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1, 3-6, 9-12 and 16** are rejected under 35 U.S.C. 102(b) as being anticipated by Bauer et al (US 6548121).

The instant **claim 1** is directed towards a process for the production of a strongly adherent coating on an inorganic or organic metalized substrate, wherein:

- a. A low temperature plasma treatment, a corona discharge treatment or a flame treatment is carried out on the substrate;
- b1. One or more photoinitiators containing at least one ethylenically unsaturated group are applied to the substrate;
- b2. The layer is *optionally* dried to remove solvent if present, and
- c. irradiated with electromagnetic waves.

It is noted that the step "b2" drying step is optional. Since the step is optional it is not required for the claim language to be met.

It is further noted that applicant specifically defines a metal or metal oxide substrate to be a metalized substrate (specification page 6, paragraphs 1 and 2).

'121 teaches a process for producing a strongly adhering coating on an organic or inorganic, including specifically a metal substrate. This method comprises: A low temperature plasma treatment is carried out on the substrate (step "a"); one or more photoinitiators containing at least one ethylenically unsaturated group are applied to the substrate), and then the substrate so precoated with a photoinitiator layer is coated with another composition comprising at least one ethylenically unsaturated monomer or oligomer (step "b"), and then the composite coating is cured by means of electromagnetic waves (UV/VIS radiation), so the photoinitiator layer is irradiated with electromagnetic waves (step "c") (**claim 1**, col 1, line 50 through col 2, line 8).

4. Regarding **claims 3-6**, '121 teaches many different photoinitiators. The photoinitiator can be benzophenones (**claim 3**) (col 17, lines 49-67). The photoinitiator is preferably a subset of the formulas of **claim 4** (col 6 line 61 through col 7, line 8). In which (IN) is further preferably limited by a subset of the formulas of **claim 5** (col 7, line 9 through col 8, line 4). In which (RG) and (RG') are further especially preferably limited by a subset of the formulas of **claim 6** (col 8, line 65 through col 9, line 10). Additionally, example 1 teaches using a photoinitiator which meets the limitations of **claims 4 and 5** (col 23, lines 29-40).

5. Regarding **claims 9-11**, '121 teaches an example 3, which deposits a metal layer on the photoinitiator layer of example 1. Example 1 exposes the substrate to a plasma formed from a mixture of argon and oxygen (**claims 9-10**). Furthermore, the photoinitiator layer of example 1 is 30 nm thick (**claim 11**) (col 23 line 17 through col 24 line 21).
6. Regarding **claim 12**, '121 teaches performing the application of the photoinitiator (step "b") as soon as possible after the corona discharge treatment (process step "a") and suggests doing so in a continuous process (col 15, lines 15-20). It is clearly envisaged from this that step b would be performed immediately after step "a" and certainly would be performed within 24 hours of step "a".

Additionally, '121 teaches performing step "b1" immediately after or within 10 hours of process step "a" (col 28, lines 22-25, as further defined by col 24, lines 55-67).

7. Regarding **claim 16**, '121 teaches performing the irradiation step with UV/VIS radiation col 2, lines 5-9), and further teaches that UV/VIS radiation is to be considered between 250 nm and 450 nm (col 17, lines 52-55).

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. **Claims 12-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121).
9. Regarding **claim 12**, '121 teaches performing the application of the photoinitiator (step "b1") as soon as possible after the corona discharge treatment (process step "a") and suggests doing so in a continuous process (col 15, lines 15-20). Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to perform step "b1" immediately after step "a" and certainly to perform it within 24 hours of step "a".
10. Regarding **claim 13**, '121 teaches that the photoinitiators can be used in combination with a solvent (col 15, lines 7-27), so materials other than photoinitiators are taught to be present in the composition. MPEP 2144.05 (II) states: "Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. '[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.'"

11. Regarding **claim 14**, '121 teaches that the process allows a high throughput per unit time (col 1, lines 50-51). The examiner takes official notice that waiting time between process steps is a well known variable for determining the maximum throughput per unit time of a process. Decreasing the waiting times between processing steps, decreases the total time for the overall process and increases the maximum throughput of a process.

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to reduce the waiting times as much as possible and perform step "c" immediately after step "b1" in order to allow for a higher throughput per unit of time as taught to be desirable by '121.

12. **Claims 2, 7, 8, 15, 17 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121) as applied to claim 1 above, and further in view of Kohler et al (US 6251963).

The independent **claim 2** has all the limitations of claim 1, but also requires **drying the deposited photoinitiator layer** and one of two additional steps:

- d1. the substrate so precoated with photoinitiator is coated with a composition comprising at least one ethylenically unsaturated monomer or oligomer, and the coating is cured by means of UV/VIS radiation or an electron beam; OR
- d2. the substrate so precoated with photoinitiator is coated with a printing ink and dried.

As discussed earlier in the rejection of claim 1, '121 teaches that the limitations of step "d1." It also teaches that photoinitiators can be used in combination



with a solvent (col 15, lines 7-27), but does not teach that the solvent is a liquid or what should be done with the solvent after the photoinitiator layer is deposited.

However, '963 is also directed towards depositing films of photoinitiators and teaches using liquid solvents with the photoinitiators in order to form a solution which is then deposited on the substrate (col 18, lines 31-48).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to choose to use a liquid solvent with the photoinitiator compositions containing a solvent of '121 as a known manufacturing option for depositing a film of a photoinitiator composition, which would produce predictable results (**claim 7**).

Furthermore, '963 teaches that after the substrate is coated with the liquid solution photoinitiator, the solvents are normally removed by drying (col 19, lines 29-31).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to then dry the liquid solution after each layer has been deposited since it was recognized to be the normal procedure for such liquid solvent bearing coatings (**claim 2**).

13. Regarding **claim 8**, '121 teaches that it is preferable for the photopolymerizable monomer or oligomer composition (the one that matches step d1) to further include a photoinitiator or coinitiator to be cured by means of UV/VIS radiation (col 17, lines 49-52).

14. Regarding **claim 15**, '963 further teaches drying the photoinitiator films at elevated temperatures (col 25, lines 51-52) and that it is advantageous to dry photoinitiators at elevated temperatures under a vacuum (col 4, lines 39-42). The use of a reduced pressure environment with the heating step would require that the coating be heated inside a vacuum chamber, which would be, by definition, an oven.

Thus it would have further been obvious to a person of ordinary skill in the art at the time of invention to dry the photoinitiator coating at elevated temperatures under a vacuum in an oven, since it was known to the art to be an advantageous method for drying photoinitiators and would produce predictable results (**claim 15**).

15. Regarding **claims 17 and 18**, '121 teaches that the method is used for forming photoinitiator layers for image forming resist coatings (col 23, lines 10-16), but does not say how such images are formed by resist technology.

However, '963 further teaches that images are formed by resist technology by covering parts of the wet or dry resist layer (the layer structure in step "d1" after depositing the monomer/oligomer containing layer and before UV/VIS exposure) with a photomask and then irradiating the layer with electromagnetic waves to crosslink a pattern in the resist (the UV/VIS exposure step) and removing the unexposed (not crosslinked) regions of the photoresist by using a solvent (col 21, lines 13-23).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to modify '121 to cover the deposited structure of a photoinitiator layer and a monomer or oligomer containing layer with a photomask so that the

irradiation step would only crosslink a pattern in the coating and then to remove the non-crosslinked regions of the coating (photoinitiator and monomer/oligomer) by using a solvent, in order to form an image in the coating as desired by '121. Using this method is obvious, because it was a known method for producing an image in a photoinitiator layer and would produce predictable results. In this interpretation, the irradiation of step "c" and the UV/VIS exposure of step "d1" occur simultaneously (**claims 17 and 18**).

16. **Claims 1, 3-6, 9-14 and 16-17** are alternatively rejected under 35 U.S.C. 103(a) as being unpatentable over Lundy et al (US 5320933) in view of Bauer et al (US 6548121) as applied in the Bauer et al rejection above.

Regarding **claims 1 and 17**, Lundy et al teaches a method for producing printed circuitry on circuit boards by using a resist method (col 1, lines 17-21). In this method, a metallized substrate is coated with a layer of a photoimagable material. The photoimagable material is masked and exposed to actinic radiation in order to form a pattern of exposed and non-exposed regions. The photoimagable material is then developed by exposing it to a solvent which removes a portion of the photoresist layer. The structure then allows unprotected areas of the metallized film to be etched, forming a circuit pattern (col 1, lines 20-35). Lundy et al also teaches that exposing photoimagable materials which comprise photoinitiators to radiation causes them to crosslink and that the development step removes the portions of the compositions that are not crosslinked (col 3, lines 46-60). Lundy et al also teaches that is very important that the photoimagable material adhere well to the metal on

the substrate (col 2, lines 33-37). However, Lundy et al does not apply the photoimagable material in the same manner as claimed by applicant.

'121 teaches a method for depositing photoinitiator containing layers for *strongly adhered* image forming resist coatings (photoimagable) (col 23, lines 10-16). It teaches that such photoinitiator coatings will be strongly adhered to the substrate if they are deposited by using a process that includes: subjecting the substrate to a low-temperature plasma discharge before depositing a coating comprising a photoinitiator that contains at least one ethylenically unsaturated group, then coating the substrate with a composition comprising one ethylenically unsaturated monomer or oligomer. The so deposited coating is irradiated with UV/VIS electromagnetic radiation in order to expose it (col 1, line 59 through col 2, line 8).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention when forming a circuit board of the Lundy et al method to substitute the Lundy et al method of depositing a photoimagable coating on the metallized (organic or inorganic) substrate with the method and compositions for depositing a photoimagable (photoinitiator containing) coating taught by '121. Then to further mask and selectively expose the coating (using UV/VIS radiation) in order to crosslink it and to selectively remove the non-crosslinked portions through the use of a solvent. Such a person would be motivated to do so in order to produce a strongly adhering coating, which Lundy et al teaches to be important to the process (**claims 1 and 17**).

17. Regarding **claims 3-6, 9-14 and 16**, they are rejected for the same reasons they were previously over '121, but now applied to the method of Lundy et al.
18. **Claims 2, 7, 8, 15 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundy et al (US 5320933) in view of Bauer et al (US 6548121) further in view of Kohler et al (US 6251963), as previously applied in the '121 in view of '963 rejection above.

These claims are rejected for the same reasons they were previously in '121 further in view of '963, but now applied to the method of Lundy et al.

19. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundy et al (US 5320933) in view of Bauer et al (US 6548121) as applied to claim 1 in the alternate rejection above, further in view of Hirakawa (US 2002/0112882).

This claim further requires that the metallized substrate be one of a group that includes a metallized ceramic substrate.

Lundy et al teaches using a circuit board with a metallization layer deposited onto a substrate (col 1, lines 16-26), but does not teach what the non-conductive substrate is.

However, Hirakawa is directed towards circuit boards and teaches using a ceramic substrate with a metallization layer deposited on it as the circuit board (abstract).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to use a ceramic material as the substrate with a metallization layer deposited on it as the circuit board substrate of Lundy et al in view of Bauer et al

since it was a known circuit board substrate material which would produce predictable results (**claim 22**).

***Response to Arguments***

20. Applicant's arguments with respect to claim 1-18 and 22 have been considered but are not convincing in view of the new ground(s) of rejection necessitated by amendment.
21. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., wherein the "(photoinitiator) layer is *cured* by irradiation" or "wherein the primer layer is *cured* by irradiation *before* the application of a coating") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In particular, the irradiation of the "primer material" does not require any curing to take place, and the deposition of the "coating" layer only requires that the "primer layer" has already been deposited on the substrate, not that the "primer layer" has already been irradiated.
22. Furthermore, it is noted that even if applicant requires the irradiation step to be different from the UV/VIS irradiation curing step, if applicant does not specifically require the step to cure the primer layer, the examiner would reject it because it is obvious to expose the coating to ambient light in order to observe the deposited film to ensure it has been deposited and uniformly for quality control purposes.

23. In response to applicant's argument that a "metallized substrate" is somehow different than a "metal substrate," as cited in the office action, in their specification, applicant has defined a substrate that is "metal" to be a "metallized substrate" (page 6, lines 1-4), so the argument is not convincing.

***Terminal Disclaimer***

24. The terminal disclaimers filed on 06-05-09 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Number 10/556609, any patent granted on Application Number 10/566741 and patent 7455891 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Conclusion***

25. No current claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL G. HORNING whose telephone number is (571) 270-5357. The examiner can normally be reached on M-F 9-5pm with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael B. Cleveland can be reached on (571)272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G. H./  
Examiner, Art Unit 1792



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/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1792